

## APPENDIX

### I. CONTRACTIONS

AC&W	Aircraft Control and Warning System	ICAO	International Civil Aviation Organization
ACCRY	Accuracy	IR	Infrared
ACFT	Aircraft	KM	Kilometer(s)
AIREP	Aircraft Weather Report(s) (Commerical and Military)	KT	Knot(s)
ANT	Antenna	LLCC	Low Level Circulation Center
APT	Automatic Picture Transmission	LVL	Level
ARWO	Aerial Reconnaissance Weather Officer	M	Meter(s)
ATT	Attenuation	M/SEC	Meters per Second
AVG	Average	MAX	Maximum
AWN	Automated Weather Network	MB	Millibar(s)
BRG	Bearing	MET	Meteorological
CDO	Central Dense Overcast	MIN	Minimum
CI	Current Intensity	MOHATT	Modified Hatrack
CLD	Cloud	MSN	Mission
CLSD	Closed	NAV	Navigational
CNTR	Center	NAVPGSCOL	Naval Postgraduate School
CONF	Confidence (number)	NEDN	Naval Environmental Data Network
CPA	Closest Point of Approach	NEDS	Naval Environmental Display Station
DEG	Degree(s)	NEPRF	Naval Environmental Prediction Research Facility
DIAM	Diameter	NESS	National Environmental Satellite Service
DIR	Direction	NET	Near Equatorial Trough
DMSP	Defense Meteorological Satellite Program	NM	Nautical Mile(s)
EASTPAC	Eastern Pacific	NOAA	National Oceanic and Atmospheric Administration
ELEV	Elevation	NRL	Naval Research Laboratory
FLT	Flight	NTCC	Naval Telecommunications Center
GOES	Geostationary Operational Environmental Satellite	OBS	Observation(s)
HATRACK	Hurricane and Typhoon Tracking (numerical forecast)	PCN	Position Code Number
HGT	Height	PE	Primitive Equation
HPAC	Mean of XTRP and Climatology	PSBL	Possible
HU	Hurricane	PTLY	Partly
HR	Hour(s)	QUAD	Quadrant
HVY	Heavy	RADOB	Radar Observation
		RECON	Reconnaissance

RNG	Range
RPD	Rapid
SAT	Satellite
SFC	Surface
SLP (MSLP)	Sea Level Pressure (Minimum Sea Level Pressure)
SMS	Synchronous Meteorological Satellite
SPOL	Spiral Overlay
SRP	Selective Reconnaissance Program
STNRY	Stationary
SST	Sea Surface Temperature
ST	Super Typhoon
TC	Tropical Cyclone
TCARC	Tropical Cyclone Aircraft Reconnaissance Coordinator
TCM	Tropical Cyclone Model
TD	Tropical Depression
TIROS	Television Infrared Observation Satellite
TS	Tropical Storm
TY	Typhoon
TUTT	Tropical Upper Tropospheric Trough (Sadler, 1976)
VEL	Velocity
VIS	Visual
VSBL	Visible
WESTPAC	Western Pacific
WMO	World Meteorological Organization
WND	Wind
WRS	Weather Reconnaissance Squadron
XTRP	Extrapolation
Z	Zulu Time (Greenwich mean time)

## 2. DEFINITIONS

**BEST TRACK** - A subjectively smoothed path, versus a precise and very erratic fix-to-fix path, used to represent tropical cyclone movement.

**CENTER** - The axis or pivot of a tropical cyclone. Usually determined by wind, temperature or pressure distribution.

**CYCLONE** - A closed atmospheric circulation rotating about an area of low pressure (counterclockwise in the northern hemisphere)

**EPHEMERIS** - Position of a body (satellite) in space as a function of time. When no geographical reference is available for gridding satellite imagery, then only ephemeris gridding is possible which is solely based on the theoretical satellite position and is susceptible to errors from satellite pitch, orbit eccentricity and the non-spherical earth.

**EXPLOSIVE DEEPENING** - A decrease in the minimum sea level pressure of a tropical cyclone of 2.5 mb/hr for 12 hrs or 5.0 mb/hr for 6 hrs (ATR 1971).

**EXTRATROPICAL** - A term used in warnings and tropical summaries to indicate that a cyclone has lost its "tropical" characteristics. The term implies both poleward displacement from the tropics and the conversion of the cyclone's primary energy sources from release of latent heat of condensation to baroclinic processes. The term carries no implications as to strength or size.

**EYE** - "EYE" is used to describe the central area of a tropical cyclone when it is more than half surrounded by wall cloud.

**FUJIWHARA EFFECT** - An interaction in which tropical cyclones within about 700 nm of each other begin to rotate cyclonically about one another. When intense tropical cyclones are within about 400 nm of each other, they may also begin to move closer to each other.

**MAXIMUM SUSTAINED WIND** - Maximum surface wind speed averaged over a 1-minute period of time. Peak gusts over water average 20 to 25 percent higher than sustained wind.

**RAPID DEEPENING** - A decrease in the minimum sea level pressure of a tropical cyclone of 1.25 mb/hr for 24 hrs (ATR 1971).

**RECURVATURE** - The turning of a tropical cyclone from an initial path toward the west of northwest to the north then northeast.

**SIGNIFICANT TROPICAL CYCLONE** - A tropical cyclone becomes "significant" with the issuance of the first numbered warning by the responsible warning agency.

**SUPER TYPHOON/HURRICANE** - A typhoon/hurricane in which the maximum sustained surface wind (1-minute mean) is 130 kt or greater.

**TROPICAL CYCLONE** - A nonfrontal low pressure system of synoptic scale developing over tropical or subtropical waters and having a definite organized circulation.

**TROPICAL CYCLONE AIRCRAFT RECONNAISSANCE COORDINATOR** - A CINCPACAF representative designated to levy tropical cyclone aircraft weather reconnaissance requirements on reconnaissance units within a designated area of the PACOM and to function as coordinator between CINCPACAF, aircraft weather reconnaissance units, and the appropriate typhoon/hurricane warning center.

**TROPICAL DEPRESSION** - A tropical cyclone in which the maximum sustained surface wind (1-minute mean) is 33 kt or less.

TROPICAL DISTURBANCE - A discrete system of apparently organized convection--generally 100 to 300 miles in diameter--originating in the tropics or subtropics, having a non-frontal migratory character, and having maintained its identity for 24 hours or more. It may or may not be associated with a detectable perturbation of the wind field. As such, it is the basic generic designation which, in successive stages of intensification, may be classified as a tropical depression, tropical storm or typhoon (hurricane).

TROPICAL STORM - A tropical cyclone with maximum sustained surface winds (1-minute mean) in the range of 34 to 63 kt, inclusive.

TROPICAL UPPER TROPOSPHERIC TROUGH (TUTT) - "A dominant climatological system, and a daily synoptic feature, of the summer season over the tropical North Atlantic, North Pacific and South Pacific Oceans," from Sadler, James C., Feb. 1976: Tropical Cyclone Initiation by the Tropical Upper Tropospheric Trough. (NAVENVPREDRSCHFAC Technical Paper No. 2-76)

TYPHOON/HURRICANE - A tropical cyclone in which the maximum sustained surface wind (1-minute mean) is 64 kt or greater. West of 180 degrees longitude they are called typhoons and east of 180 degrees they are called hurricanes. Foreign governments use these or other terms for tropical cyclones and may apply different intensity criteria.

WALL CLOUD - An organized band of cumuli-form clouds immediately surrounding the central area of a tropical cyclone. The wall cloud may entirely enclose the eye or only partially surround the center.

### 3. REFERENCES

Atkinson, G. D., and Holliday, C. R., 1977: Tropical Cyclone Minimum Sea Level Pressure - Maximum Sustained Wind Relationship for Western North Pacific, *Monthly Weather Review*, Vol. 105, No. 4, pp. 421-27 (also FLEWEACEN TECH NOTE: JTWC 75-1).

Dvorak, V. F., 1973: A Technique for the Analysis and Forecasting of Tropical Cyclone Intensities from Satellite Pictures, NOAA TM NESS 45, 19 pp.

Guard, C. P., 1979: The Intensity of Recurving Western North Pacific Tropical Cyclones: A New Look. Unpublished, 33 pp. (available from NAVOCEANCOMCEN/JTWC, COMNAVMAR, Box 17, FPO SF 96630).

Ramage, C. S., 1971: Monsoon Meteorology, Academic Press, 253 pp.

Riehl, H., 1971: Intensity of Recurving Typhoons, NAVWEASERSCHFAC Technical Paper No. 3-71, 11 pp.

Sadler, J. C., 1976: Tropical Cyclone Initiation by the Tropical Upper Tropospheric Trough, NAVENVPREDRSCHFAC Technical Paper No. 2-76, 103 pp.

Sikora, C. R., 1976: A Reevaluation of the Changes in Speed and Intensity of Tropical Cyclones Crossing the Philippines, FLEWEACEN TECH NOTE: JTWC 76-2, 11 pp.

## DISTRIBUTION

AFGWC (2)  
 AFGL/LYU (2)  
 AF WEACEN TAIWAN (3)  
 AMER EMBASSY, BANGKOK (5)  
 AMERICAN INST OF TAIWAN (1)  
 ARRS/CC (2)  
 AWS/DNT (5)  
 AWS/DOR (5)  
 BUR OF MET, BRISBANE (2)  
 BUR OF MET, MELBOURNE (4)  
 BUR OF MET, PERTH (1)  
 CENWEABUR TAIWAN (3)  
 CINCPAC (2)  
 CINCPACAF/DOW (1)  
 CINCPACFLT (5)  
 CIUDAD UNIV, MEXICO (1)  
 CIVIL DEFENSE, GUAM (4)  
 CIVIL DEFENSE, SAIPAN (6)  
 CNO WASHINGTON DC (1)  
 CNOC (2)  
 COLORADO STATE UNIV (2)  
 COLORADO STATE UNIV (LIBR) (1)  
 COMFAIRECONRON ONE (VQ-1) (3)  
 COMLOGSUPFORSEVENTHFLT (1)  
 COMNAVAIRSYS (1)  
 COMNAVFAENGCOMPACDIV (1)  
 COMNAVFORJAPAN (1)  
 COMNAVMARIANAS (2)  
 COMNAVSURFPAC (2)  
 COMPATRECONFORSEVENTHFLT (1)  
 COMPHIBGRU ONE (1)  
 COMSC (1)  
 COMSEVENTHFLT (2)  
 COMSUBGRU SEVEN (1)  
 COMTHIRDFLT (1)  
 COMUSNAVPHIL (1)  
 DDC, VA (1)  
 DEPT OF AIR FORCE (1)  
 DET 2, 1WW (2)  
 DET 2, 7WW (1)  
 DET 4, 1WW (2)  
 DET 4, HQ AWS (2)  
 DET 5, 1WW (1)  
 DET 8, 30WS (2)  
 DET 10, 30WS (1)  
 DET 15, 30WS (1)  
 DET 17, 30WS (1)  
 DET 18, 30WS (1)  
 DISTAD MARSHALLS (10)  
 ENVSCISUPGRU (4)  
 ESCAP, BANGKOK (5)  
 FAA, GUAM (5)  
 FLENUMOCEANCEN MONTEREY (2)  
 FLORIDA SEVERE WEATHER NETWORK (4)  
 FLORIDA STATE UNIV TALLAHASSEE (2)  
 GEN MET DEPT THAILAND (2)  
 GEOLOGICAL SURVEY, GUAM (1)  
 GOVERNOR OF GUAM (4)  
 GUAM PUBLIC LIBRARY (5)  
 INDIA MET DEPT (2)  
 INST OF PHYSICS, TAIWAN (2)  
 JAPAN MET AGENCY (3)  
 JASDF, TOKYO (2)  
 LOS ANGELES PUBLIC LIBR (1)  
 MAC/HO, IL (2)  
 MCAS FUTENMA (1)  
 MCAS IWAKUNI (2)  
 MET DEPT BANGKOK (1)  
 MET RESEARCH INST LIBR, TOKYO (2)  
 NASA GREENBELT, MD (4)  
 NAT CLIM CNTR, NC (1)  
 NATWEASERV FOROFF, HONOLULU (2)  
 NATWEASERV PACREG (2)  
 NAVAL ACADEMY (1)  
 NAVEASTOCEANCEN, NORFOLK (1)  
 NAVHISTCEN (1)  
 NAVHISTCEN, DIR (1)  
 NAVOCEANCOMCEN, ROTA (1)  
 NAVOCEANCOMFAC, JACKSONVILLE (1)  
 NAVOCEANCOMFAC, YOKOSUKA (3)  
 NAVPOLAROCEANCEN, SUITLAND (1)  
 NAVWESTOCEANCEN, PEARL HARBOR (2)  
 NAVY ROTC, TULANE UNIV (1)  
 NCBC (1)  
 NEPRF (8)  
 NESS/SFSS (1)  
 NHC, NOAA (3)  
 NOAA/EDS CORAL GABLES, FL (4)  
 NOAA/EDS WASHINGTON, DC (2)  
 NOAA/ERL BOULDER, CO (1)  
 NOAA/ERL MIAMI (2)  
 NOAA/HYDROLOGY BR SILVER SPRINGS, MD (1)  
 NOAA/LIBRARY ROCKVILLE, MD (1)  
 NOAA/NESS WASHINGTON DC (2)  
 NOAA/PMEL SEATTLE, WA (2)  
 NOCD, AGANA (3)  
 NOCD, ALAMEDA (1)  
 NOCD, ASHEVILLE (1)  
 NOCD, ATSUGI (1)  
 NOCD, BARBERS POINT (1)  
 NOCD, CUBI POINT (1)  
 NOCD, KADENA (2)  
 NOCD, MISAWA (2)  
 NPGS DEPT OF MET (3)  
 NPGS LIBR (1)  
 OCEAN ROUTES INC, CA (2)  
 OCEANO SERVICES INC, CA (1)  
 OKINAWA MET OBS (1)  
 OLG/HQ AWS (1)  
 OUSDRE, WASHINGTON, DC (2)  
 PAGASA RP (3)  
 ROYAL OBSERVATORY HONG KONG (4)  
 TAIWAN UNIV (3)  
 TEXAS A&M UNIV (1)  
 TTPI, SAIPAN (8)  
 TYPHOON COMM SECR, MANILA (1)  
 UNIV OF CHICAGO (1)  
 UNIV OF GUAM (2)  
 UNIV OF HAWAII DEPT OF MET (3)  
 UNIV OF HAWAII LIBR (1)  
 UNIV OF ILLINOIS AT URBANA-CHAMPAIGN (1)  
 UNIV OF MEXICO (1)  
 UNIV OF RP (2)  
 UNIV OF WASHINGTON (1)  
 USS BLUE RIDGE (1)  
 USS CONSTELLATION (2)  
 USS CORAL SEA (1)  
 USS ENTERPRISE (1)  
 USS KITTY HAWK (1)  
 USS LONG BEACH (2)  
 USS MIDWAY (1)  
 USS NEW ORLEANS (2)  
 USS OKINAWA (1)  
 USS RANGER (2)  
 USS TARAWA (1)  
 USS TRIPOLI (1)  
 WEA SERV MET OBS (2)  
 WORLD WEATHER BLDG LIBR (1)  
 1WW/DON (6)  
 3AD/DOX (1)  
 3WW/DNC (1)  
 5WW/DNC (1)  
 30WSQ (3)  
 41RWRW (2)  
 43SW/OI (1)  
 54WRS (3)  
 3350 TCHTG (1)

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Annual Typhoon Report 1979	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) ANNUAL TYPHOON REPORT 1979		5. TYPE OF REPORT & PERIOD COVERED Annual (JAN-DEC 1979)
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U. S. Naval Oceanography Command Center/Joint Typhoon Warning Center (NAVOCEANCOMCEN/JTWC) FPO San Francisco 96630		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U. S. Naval Oceanography Command Center/Joint Typhoon Warning Center (NAVOCEANCOMCEN/JTWC) FPO San Francisco 96630		12. REPORT DATE 1979
		13. NUMBER OF PAGES 191
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)  UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Tropical cyclones                      Tropical storms Tropical cyclone forecasting          Tropical depressions Tropical cyclone research              Typhoons Tropical cyclone steering model       Meteorological satellite Tropical cyclone fix data              Aircraft reconnaissance		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Annual publication summarizing the tropical cyclone season in the western North Pacific, Bay of Bengal and Arabian Sea. A brief narrative is given on each significant tropical cyclone including the best track. All reconnaissance data used to construct the best tracks are provided. Forecast verification data and statistics for the JTWC are summarized. Research efforts at the JTWC and NEPRF are discussed briefly.		

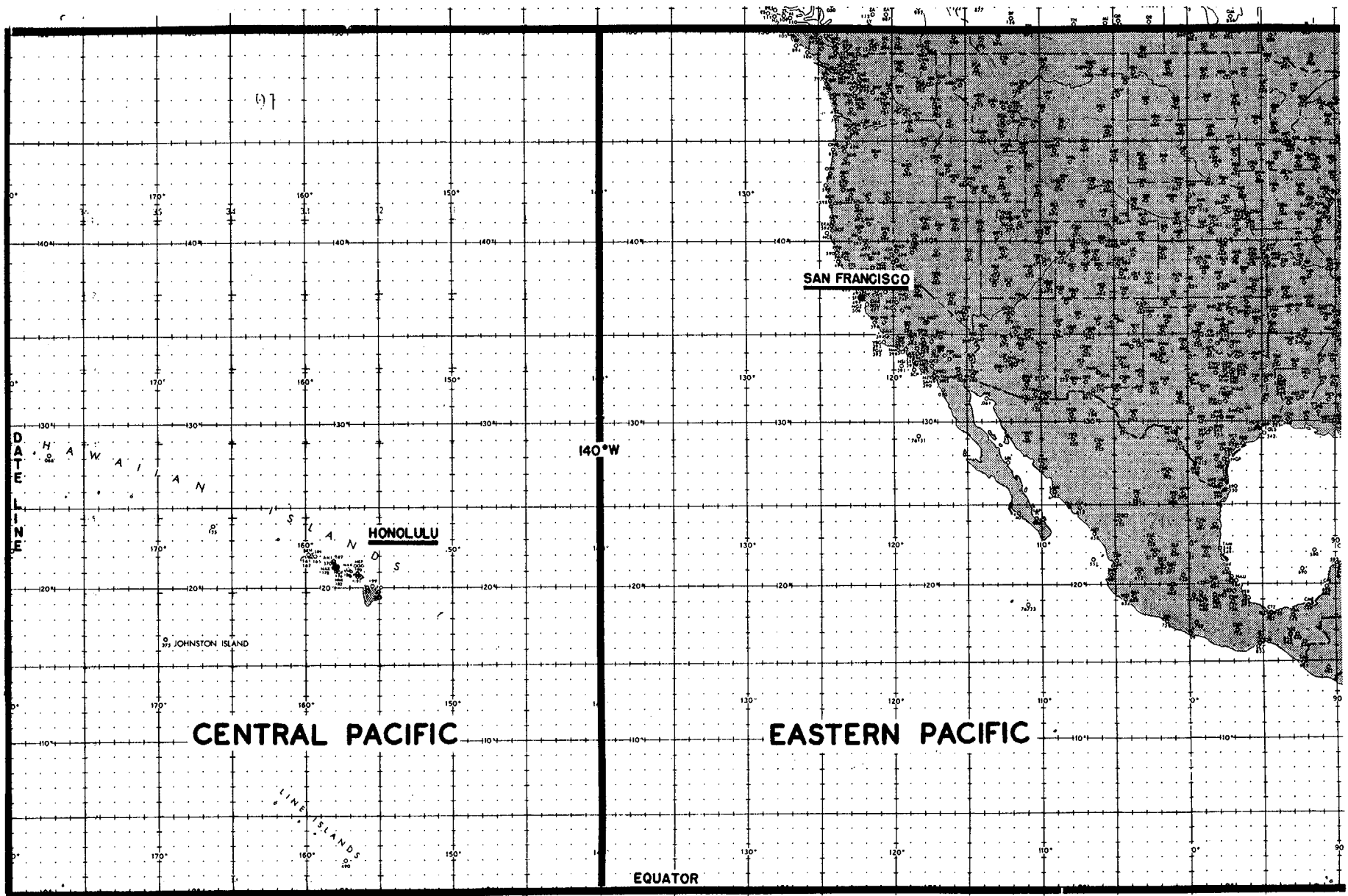
DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE  
S/N 0102-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)





**Areas of Responsibility - Central and Eastern Pacific Hurricane Centers**

